

17.1.2 Authorized Purposes: Flood control, water quality improvement, hydroelectric power generation, recreation, and fish and wildlife management.

17.1.3 Lake and Watershed Data

Pools	Surface Elevation (ft. above m.s.l.)	Current Capacity (1000 AF)	Surface Area (A)	Shoreline (miles)
Flood Control	892.0	779.4	38,200	
Multipurpose	867.0	878.3	24,900	300
Total		1,657.7		

Total watershed area: 1,160 sq miles (742,400 A)

Watershed ratio: 19.43 FC / 29.82 MP

Average Annual Inflow: 832,679 acre-feet

Average Annual outflow: 000 acre-feet

Average flushing rate:

Sediment inflow (measured): 8,953 acre-feet (1969 – 1987)

17.2 2005 Activities

Stockton Lake was categorized as an ‘ambient’ lake during 2005, thus only surface samples were collected at the three lake sites. Sample collections occurred from May through September 2005, with a single vertical profile recorded at the three lake sites during August. Stockton Lake staff (OF-ST) providing field sampling assistance during 2005 was Stanton Rains and Greg Thomas. Tom Long, OF-ST Operations Manager, provided insight and background regarding Stockton Lake.

17.3 2005 Data

Comparative historic data consists of single sample trips in 1999 (July) and 2002 (August) and monthly data from May through September 2005.

17.3.1 Inflow

No inflow samples were collected from the Stockton Lake watershed during 2005.

17.3.2 Lake

Total nitrogen (TN) median concentrations ranged from 0.92 – 1.03 mg/L (Figure 17.2), which exceeds EPA’s proposed nutrient criteria value of 0.46 mg/L TN. These values are typical for other lakes within the district. Median total phosphorus (TP) concentrations ranged from 0.03 – 0.05 mg/ (Figure 17.3), which are the lowest TP values within the district and typical for mesotrophic Ozark waters. EPA has proposed a nutrient criteria value of 0.008 mg/L TP for this ecoregions.

The ratio of TN:TP can be used as a surrogate to determine the dominant algal community within a waterbody. Ratios $\geq 20:1$ are indicative of desirable algal

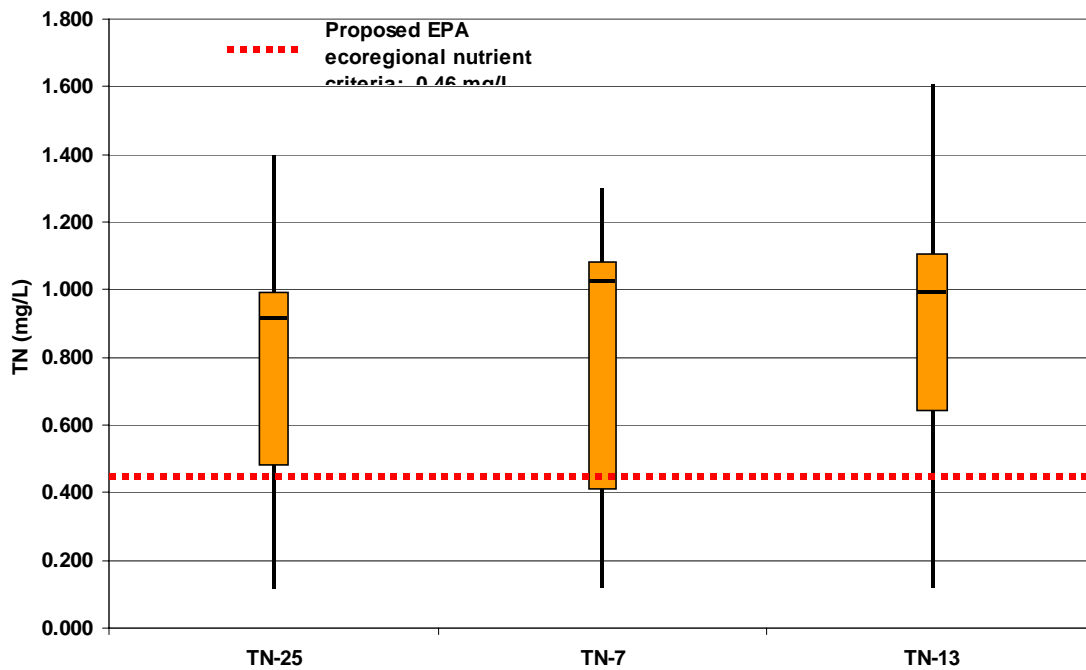


Figure 17.2. Box plots of surface water sample total nitrogen (TN) concentrations measured at lake sites from 199, 2002, and 2005 in Stockton Lake.

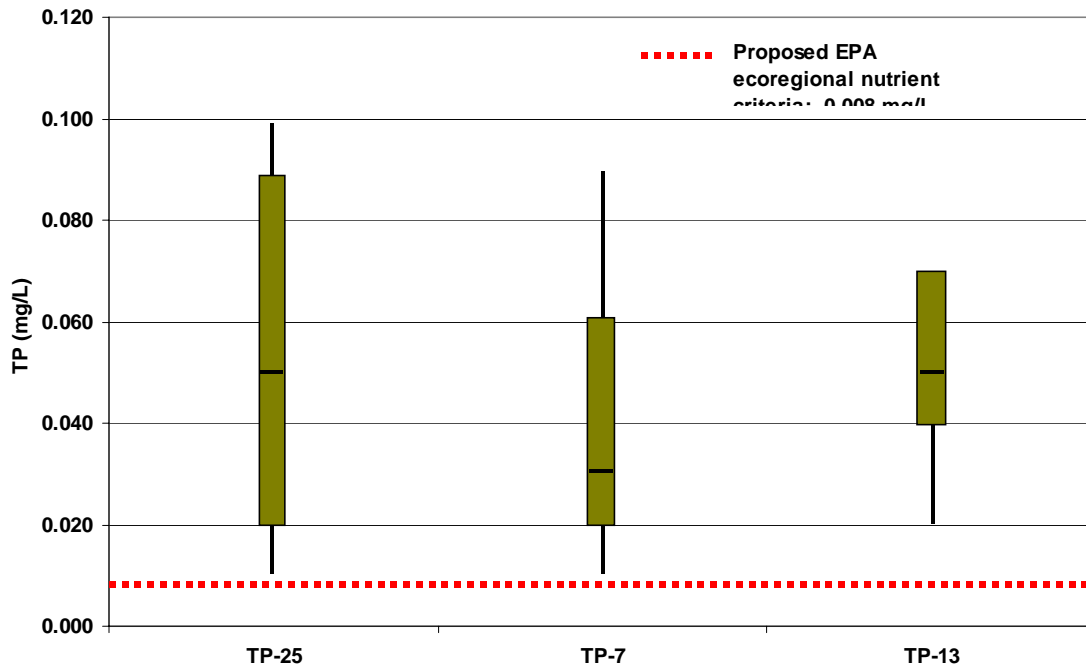


Figure 17.3. Box plots of surface water sample total phosphorus (TP) concentrations measured at lake sites from 1999, 2002, and 2005 at Stockton Lake.

communities, whereas ratios $\leq 12:1$ are indicative of bloom-forming cyanobacteria (blue green algae). As would be expected, there is high monthly variability in the TN:TP ratio at all sites, with lowest values recorded during late summer and early fall (Figure 17.4). Sites with TN:TP ratios < 12 are at risk for cyanobacteria blooms, however, no microcystin toxins were detected at Stockton Lake during sampling in 2000 (Dr. Jennifer Graham, USGS, personal communication). Cyanotoxins are a concern related to both drinking water and recreational use.

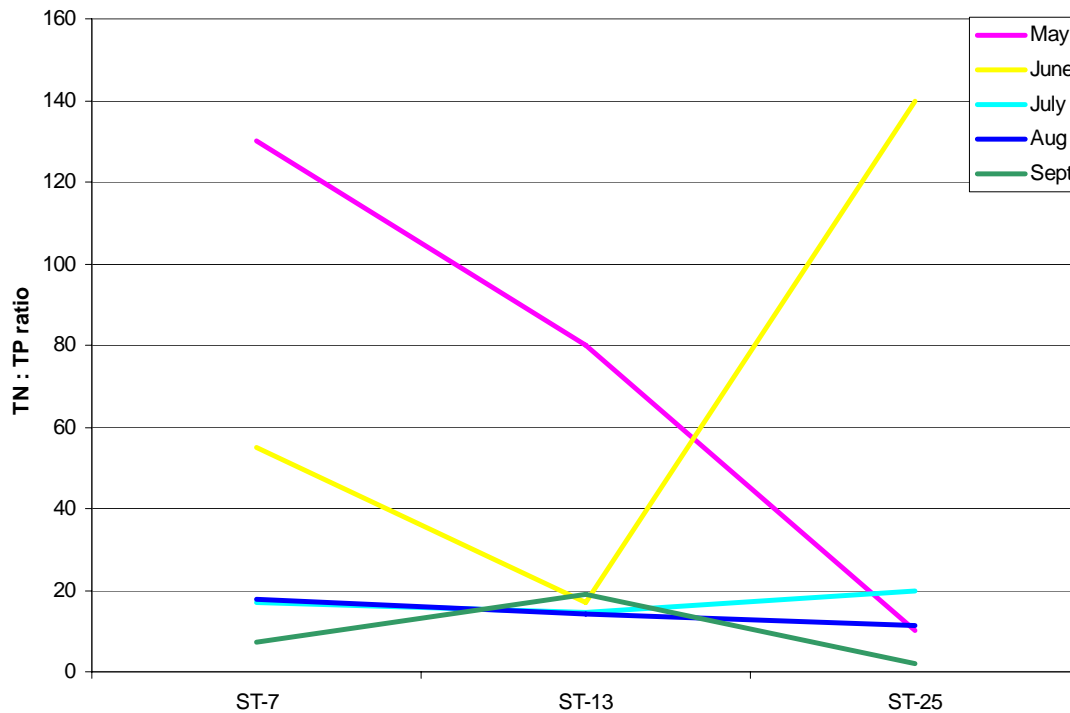


Figure 17.4 Plot of total nitrogen : total phosphorus (TN : TP) ratio by site during 2005 at Stockton Lake.

Median chlorophyll *a* concentrations ranged from 5 – 19 ug/L from lake samples collected during 1999 and 2005 (Figure 17.5). Lowest chlorophyll concentrations were measured at Site 25 (main lake – tower), while significantly higher concentrations are measured at both upper lake sites. Secchi depth measured during August indicated water clarity was moderately clear in the upper lake sites (Sites 7 & 13 = 1.2 m) and very clear in the main deep lake section (Site 25 = 2.5 m).

No herbicide or metals data has been collected within the Stockton Lake watershed between 1999 and 2005.

A single vertical profile was recorded on 11 August 2005. Parameters included temperature, dissolved oxygen, pH, conductivity, and turbidity. Based on this profile, the lake was thermally and chemically stratified between 7 – 9 m in depth (Figure 17.6).

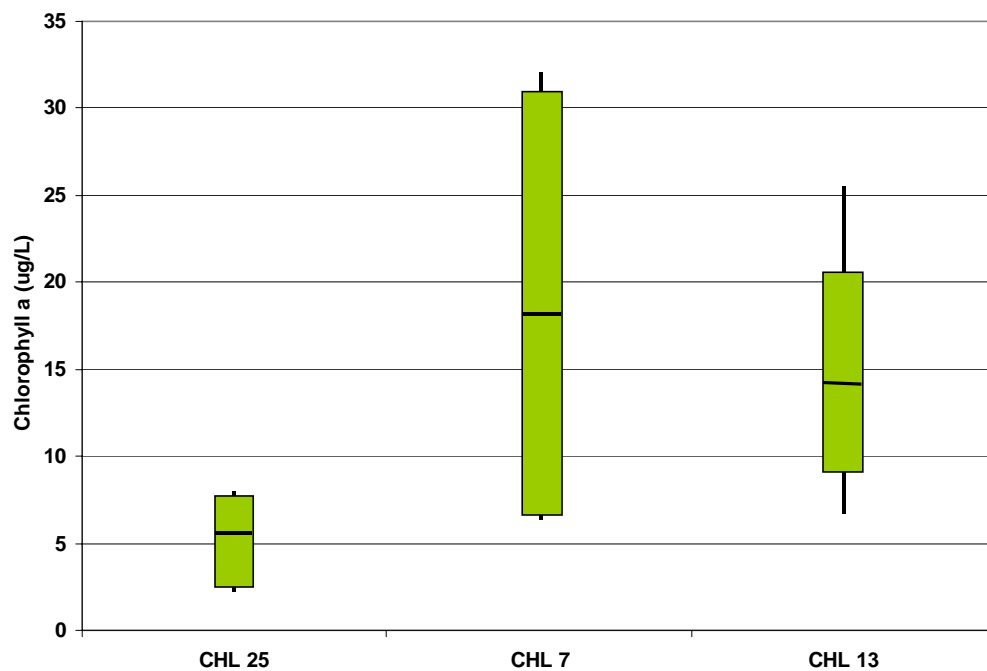
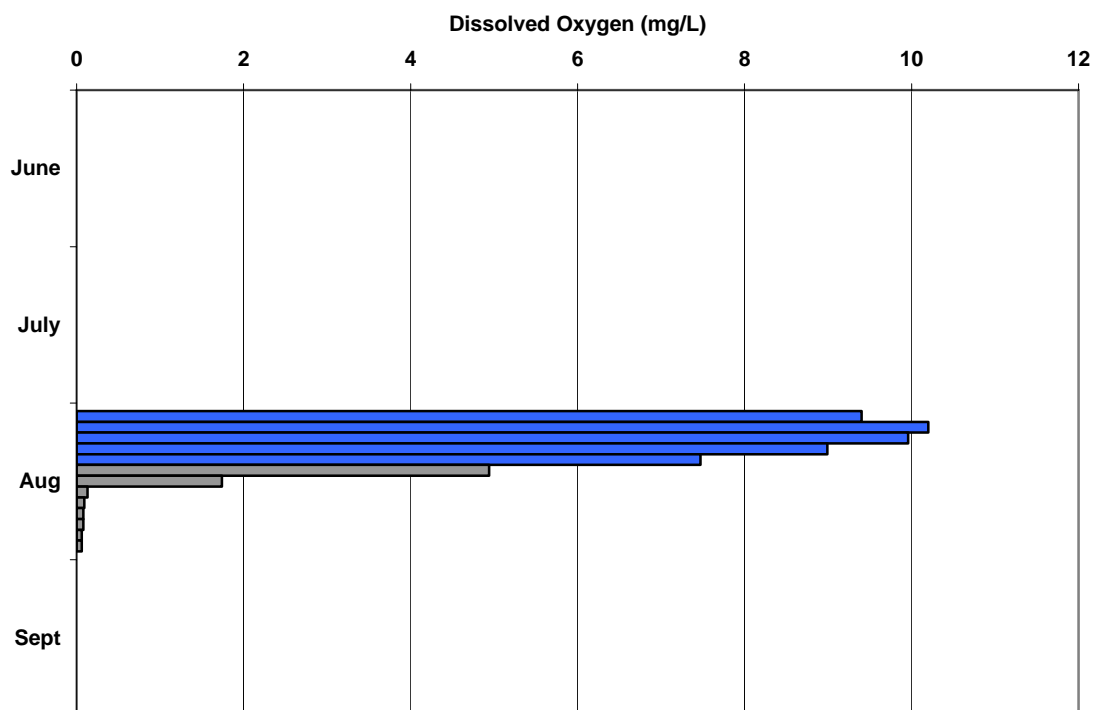


Figure 17.5. Box plots of chlorophyll a concentrations from samples collected by site during 1999 and 2005 at Stockton Lake.



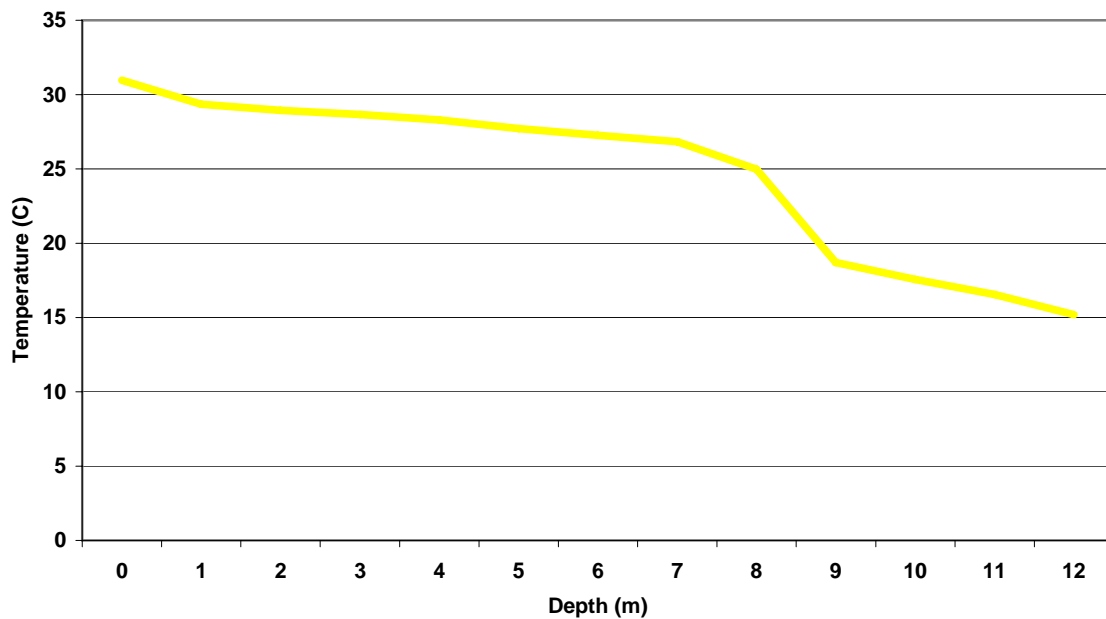


Figure 17.6. Dissolved oxygen concentration (mg/L) histogram and temperature (°C) plot from a vertical profile recorded at Site 25 during August 2005 at Stockton Lake.

17.3.3 Outflow

No outflow samples were collected during 2005 from Stockton Lake.

17.4 Future Activities and Recommendations

Sampling activities for 2006 will include transition to monthly 'intensive' monitoring from April through September, as well as conducting monthly vertical profiles at each of the four lake sites.